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SPECIAL NOTICE INSIDE

A CUMULATIVE INDEX  
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JANUARY 1972

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## SPECIAL NOTICE

The abstract sections of the monthly supplements of *Aeronautical Engineering* can be bound separately. Individual abstracts can be located readily by means of the page numbers given at each entry, e.g., p0524 N71-28368. To assist the user in binding Supplements SP-7037 (02) through SP-7037 (13), a title page is included in the back of this Cumulative Index.



**A CUMULATIVE INDEX  
TO  
AERONAUTICAL ENGINEERING  
A Special Bibliography**

This Cumulative Index supersedes the indexes contained in supplements SP-7037 (02) through SP-7037 (13).



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# INTRODUCTION

## WHAT THIS CUMULATIVE INDEX IS

This publication is a cumulative index to the abstracts contained in NASA SP-7037 (02) through NASA SP-7037 (13) of *Aeronautical Engineering: A Special Bibliography*. NASA SP-7037 and its supplements have been compiled through the cooperative efforts of the American Institute of Aeronautics and Astronautics (AIAA) and the National Aeronautics and Space Administration (NASA).

Entries prepared by the two contributing organizations are identified as follows:

1. NASA entries by their STAR accession numbers (N71-10000 series).
2. AIAA entries by their IAA accession numbers (A71-10000 series).

## HOW THIS CUMULATIVE INDEX IS ORGANIZED

This Cumulative Index includes a subject index, a personal author index, a corporate source index, a contract number index, and a report/accession number index.

## HOW TO USE THE SUBJECT INDEX

Two types of cross-references appear in the subject index:

1. Use (U) references indicate that the subject term is not "postable," i.e., not a valid term, and the following term or terms are used instead. For example:

AIRCRAFT PROTUBERANCES  
U PROTUBERANCES  
FLIGHT PERFORMANCE  
U FLIGHT CHARACTERISTICS

2. Narrower Term (NT) references refer the user to more specific headings in the same subject area, under which additional material on the subject may be found. For example:

FLOW RESISTANCE  
NT AERODYNAMIC DRAG  
NT FRICTION DRAG  
NT SUPERSONIC DRAG

In addition, a searcher may use the notations of content in the index to narrow further his quest for particular items. This is because subject terms can readily include more than one class of document. For example:

AIRLINE OPERATIONS  
All-weather operations, including  
pilot role, instrument landing  
systems and guidance aids.  
Airport congestion as constraint on  
air travel, considering runway  
capacity and adjusted demand.

illustrates a case where two references on different topics are listed under the same subject term.

## HOW TO USE THE PERSONAL AUTHOR INDEX

All personal authors used in the abstract-section citations in the individual Supplements appear in the index. Differences in transliteration schemes may require multiple searching of the index for variants of an author's name. For example:

EMELIANOV, M.D.  
and  
YEMELYANOV, M.D.



## HOW TO USE THE CORPORATE SOURCE INDEX

The corporate source index entries are abridged versions of the corporate sources used in the abstract-section citations in the individual Supplements. The corporate source supplementary (organizational component) does not appear in the index. For example:

BOEING CO., SEATTLE, WASH. MILITARY AIRCRAFT SYSTEMS  
DIV. (Corporate source at citation)

BOEING CO., SEATTLE, WASH. (Corporate source index entry)

## HOW TO USE THE CONTRACT NUMBER INDEX

All contract numbers that are identified in the abstract-section citations in the individual Supplements appear in this index. Changes by agencies in the style in which contract numbers are presented may require multiple searching for variants. For example:

AF 33(615)-71-C-1758  
F33615-71-C-1758

## HOW TO USE THE REPORT/ACCESSION NUMBER INDEX

All report numbers that have been assigned by the corporate source, monitoring agency or cataloging activity appear in this index. Variations in initial cataloging may result in different report number series. For example:

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ONERA-TP-924

## IDENTIFICATION OF DESIRED SUPPLEMENT

The abstract and descriptive cataloging for any accession number selected from the indexes may be found in the appropriate Supplement. The page-number range of each Supplement appears on the inside front cover of this index. Once the range of page numbers containing the selected accession number is located in the second column, the desired Supplement number will be found in the first column. For example:

Page 195 will be found in Supplement 05.

## AVAILABILITY OF DOCUMENTS

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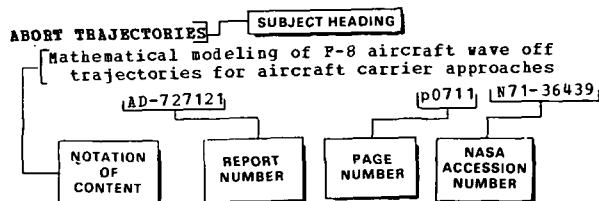
# SUBJECT INDEX

AERONAUTICAL ENGINEERING / A Special Bibliography

JANUARY 1972

1971 Cumulative Index

## Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The Notation of Content (NOC), rather than the title of the document, is used to provide a more exact description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the Notation of Content, e.g., p0052 N71-11466. Under any one subject heading, the accession numbers are arranged in sequence with the /AA accession numbers appearing first.

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NT AIRBORNE/SPACEBORNE COMPUTERS

Aircraft electric systems control by solid state switching, discussing reliability, service life, versatility and compatibility

Reverse flow temperature probe design and calibration for vertical soundings from aircraft, comparing to radiosonde method

Short haul STOL concepts including stolport potentials, onboard avionics, vehicle characteristics, tradeoffs and current nonproductive flying due to traffic congestion

Airborne radar as helicopter approach aid

Aircraft midair collision avoidance, discussing Elimination Range Zero system operation procedures and cost

Airborne surveillance for environmental management, discussing earth resources program, aerial sensors for thermal water pollution, crop disease, salinity and geological structure

Draw-through cooling of electronic equipment in subsonic and supersonic commercial jet transports, discussing internal circulation system design

[SAE-AIR-64A]

Avionics growth, discussing use of digital computers, solid state transducers, integrated circuits, electronic flight instruments, area navigation and collision avoidance systems

Terrain following radar for airborne guidance of low flying military aircraft

Airborne Doppler radar receiver transmitter failure testing by Versatile Avionics Shop Test computer controlled system

Self contained lightweight airborne data acquisition system for atmospheric and meteorological research, using analog recorder and telemetry system

Integrated flight test data system combining digital airborne data acquisition/recording system with telemetry/microwave link to computerized ground station

Onboard weighing system for gross weight determination and center of gravity location of Alouette helicopter, using load sensors, electrical circuits and visual indicators

High speed airborne scanning navigational radar antenna with matched patterns, using offset horn fed reflector and polarization modes for improved visual display

Helicopter aerial design problems, considering antenna multiplicity use of nonmetallic structures and complexity of airborne radio systems

Airborne ECM receiver, determining conditions for detecting victim radar signal before signal reflection from aircraft

Book on fluidic systems design covering analog and digital control, application to aircraft, spacecraft, computers, tracking devices and equivalent circuits

Category II operations at various airports, considering all-weather landing requirements of airborne equipment, maintenance standards, pilot training, etc

Airborne display and electric management system, discussing weight reduction, protective function coordination, power quality, onboard maintenance, data processing and reliability

Comet 4 installation and experimental program, investigating avionics systems integration techniques

Radio controlled small aircraft as measurement platform for meteorological sensors, discussing development and performance from field tests

Military and civil aircraft navigation systems development, emphasizing self contained airborne equipment

Airborne communications with AN/ARC-154 transceiver in single radio, discussing extended frequency coverage, multimode operation, navigation and input/output provisions

Real time reconnaissance cockpit display system for airborne sensor systems, providing night combat imagery

Aircraft onboard equipment tests in air navigation aid satellite project, estimating tracking random errors

Time and frequency synchronization for EROS airborne collision avoidance system, considering impact on aeronautical communication, navigation and surveillance

[CASI PAPER 72/17]

Complex airborne electronic system design for interference minimization, considering electromagnetic compatibility

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Soviet book on aircraft power plant systems and devices covering layout, engine attachment, propellers, control, fuel and oil systems, fire fighting, monitoring, etc
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Book on fixed and rotary winged aircraft air cooled piston engine design, performance and maintenance in business and military operators manual terminology
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Fluidic pressure ratio control for vertical takeoff aircraft lift engine fuel system, describing breadboard circuit, test bed and flight standard
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Axial turbomachine three dimensional cascade flow calculation from dynamics vector equations

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Soviet book on theory of aircraft bladed machines covering axial flow, centrifugal and composite turbines and compressors, thermodynamic efficiency, control turbocompressor matching, etc

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Quasi-axisymmetric and superposed fine fluctuating structure of ideal incompressible vortex flows in axial flow turbines, assuming infinite mutual blade proximity

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German monograph on accelerating grids in wind tunnel and axial flow turbine, covering plane/secondary flows past cascades and stator/rotor blading

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Multicomponent nonequilibrium air flow past axisymmetric blunt body, calculating flow distribution at various attack angles with time dependent technique

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- Design, fabrication and tests of boron/epoxy reinforced stringers for CH-54B tail cone [NASA-CR-111929] p0674 N71-34013
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Axial turbomachines boundary layer flow, describing two dimensional cascade calculation methods

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Turbulent boundary layer structure and prediction, considering various turbulence onset theories

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Boundary layer flow with large mass injection rate, presenting numerical method with rapid convergence for increasing blowing parameter

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[AIAA PAPER 71-623] p0495 A71-32544
- Air injection into turbulent boundary layer flow through porous plate, examining heat transfer and shielding efficiency  
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- German monograph on pressure changes as boundary layer effect in tube wind tunnels covering test equipment and experimental design, Becker theory, pipe flow, etc  
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- Vortex flow over helicopter rotor square tips, using visualization technique with ammonia vapor boundary layer flow over diazonium salt solution  
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- Boundary layer discontinuity on helicopter rotor blade in hovering using flow visualization  
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- French monograph on laminar boundary layer on circular cone at angle of incidence in supersonic stream, calculating separation from parabolic equations by numerical integration  
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- Boundary layer separation in viscous flow around rigid bodies  
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- Slender cone boundary layer transition under angle of attack at Mach 21 with promoted leeward and fixed windward ray  
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- Boundary layer transition studies of several pointed bodies of revolution at supersonic speeds  
[NASA-TN-D-6063] p0053 N71-11520
- Hypersonic boundary layer transition and hypersonic heat transfer on cylindrical shells, cones and flat plates  
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- Laminar boundary layer transition, separation and streamline direction on rotating helicopter blades  
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- Ground boundary layer effects of fixed ground plane for powered STOL wind tunnel model, discussing flow breakdown criteria, contraction lag, strut fairing interference, etc  
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- Helicopter wake and boundary layer effects on rotor aerodynamic performance in hovering, low and high speed forward flight  
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- Boundary value problems and applications in fluid and gas mechanics - Conference, Kazan, U.S.S.R., May 1969  
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- Inverse boundary value problems in hydroaeromechanics, involving profile construction from given velocity or pressure distribution and supersonic flow boundaries determination  
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Soviet book on theory of aircraft bladed machines covering axial flow, centrifugal and composite turbines and compressors, thermodynamic efficiency, control turbocompressor matching, etc

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[NASA-CR-114287]

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Airplane interior materials ignition and fire extinguishing foam  
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Soviet book on aircraft power plant systems and devices covering layout, engine attachment, propellers, control, fuel and oil systems, fire fighting, monitoring, etc  
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Aerial land rover for special needs of developing countries as passenger and freight aircraft, crop spraying and dusting, aerial survey and fire fighting  
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Airport crash fire fighting equipment requirements and rescue operations  
p0694 A71-43389

Surveying crash fire and rescue equipment at North American and Canadian airports  
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Survey conducted to develop minimum requirements for airport fire fighting and rescue services  
[FAA-AS-71-1] p0307 N71-19426

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Aircraft fire hazard reduction, discussing early detection, extinguishing equipment and emergency landing survival  
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Cargo aircraft crew safety and survival, describing restraint, escape, flight deck interior doors, fire and smoke hazards and personnel environmental protection  
[SAE-ARP-1139] p0187 A71-19643

Concorde power plant fire protection system, describing prototype engine bay overheat detection system and additional UV optical fire detection system  
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Fire protection tests in small fuselage mounted turbojet engine and nacelle installation  
[FAA-NA-70-41] p0048 N71-11018

Jet engine combustion chamber burn-through fire and methods for controlling damage  
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Design, development, and flight testing of fire suppressant void filler foam kits for lower hemisphere of fuel tanks in various tactical army aircraft  
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Demonstration and evaluation of crash-resistant bladder fuel tank system in full-scale aircraft wing assembly  
[FAA-NA-71-34] p0627 N71-32077

Simulated JP-4 jet fuel fire tests of high temperature cabin pressure sealant and insulating plastics and rubbers  
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Studying aircraft accidents to determine impact angle and speed criteria for designing nuclear airplane fission product containment vessel  
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Book on fixed and rotary winged aircraft air cooled piston engine design, performance and maintenance in business and military operators manual terminology  
p0138 A71-17125

Canadian R and D on fixed wing civil STOL aircraft, discussing augmentor wing concept using jet powered lift augmentor system  
p0503 A71-33470

Augmentor wing high-lift aerodynamics, discussing results of wind tunnel tests and simulation studies  
[CASI PAPER 72/20] p0602 A71-37606

Design of supersonic aircraft with novel fixed, swept wing planform  
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Wind tunnel tests to determine effects of wing dihedral angle on aerodynamic characteristics of highly swept fixed-wing configuration  
[NASA-TM-X-2261] p0384 N71-22622

Computerized simulation of helicopter tactical maneuvers in three body, three dimensional environment including fixed wing and rotary wing aerodynamic forces  
[AD-721527] p0528 N71-28409

Rotary wing downwash influence on fixed wing flow using magnetic induction vortex model  
[DLR-PB-70-62] p0575 N71-30040

Fixed wing aircraft employing free fall and circling-line techniques in rescue of personnel and retrieval of equipment  
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Afterburning flame stabilization in turbofan engines  
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Crash fire hazard evaluation of jet fuels  
[FAA-NA-70-64] p0180 N71-16864

Fuel tank vapor space characteristics for simulated helicopter fuel tank and evaluation of existing potential hazard from vibration environment  
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Tests of jet engine fuels to determine effects of sloshing and vibration in aircraft fuel tanks on flammability hazards  
[AD-718091] p0400 N71-23805

Small scale impact tests of aircraft type fuels for gas turbines to determine burning, misting, and splatter characteristics  
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- Sand and dust erosion on small VTOL gas turbine engines, discussing effects on inlets, compressor housing and blades  
p0097 A71-15436
- Soviet book on aircraft gas turbine engine assembly covering organization, specified accuracy, automatic systems, mechanization problems, quality control, etc  
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p0187 A71-19647
- Soviet book on aircraft gas turbine and internal combustion engines covering structural design schemes, inlet devices, combustion chambers, materials, compressors, etc  
p0203 A71-20674
- Gas dynamic test stand for cyclic thermal load testing of gas turbine engine materials and components at variable heating and cooling rates and mechanical loads  
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- Combustor design for minimum exhaust smoke emission from aircraft gas turbine jet engines, considering air pollution  
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## U EFFICIENCY

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## U SENSITIVITY

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## U FLIGHT

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Holographic recording of optical inhomogeneities in gas flow in hypersonic wind tunnels, using Mach-Zehnder interferometer and schlieren apparatus

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Differential interferometry and schlieren photography for hypersonic aerodynamic hologram analysis

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Q-switched ruby laser holography with optical equipment to compensate for spatial and temporal incoherence for contouring, aerodynamic visualization, and nondestructive testing

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Interferometric holographic analysis of density fields around half-angle conical bodies in supersonic wind tunnels with 10 deg angle of attack

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Variable weight composite materials for aircraft optimal adhesive bonding structural designs, discussing C-5A tow weight saving Ti honeycomb applications

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Boron-epoxy structural skins design for F-14 honeycomb horizontal stabilizer, using computer program

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## U PINS

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Forward horizontal speed influence on aerodynamic characteristics of air cushion vehicle with circular nozzles and cylindrically or conically shaped curtains

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Longitudinal stability of plate-like load towed beneath helicopter in horizontal forward flight

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Aft vs canard horizontal tail locations for fighter/attack configuration at sub and supersonic speeds, observing lift coefficient, L/D and longitudinal stability

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Supersonic flow separation around cross shaped horizontal tail plane with subsonic leading edge, obtaining pressure distribution and aerodynamic characteristics

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Sailplane elevator induced maneuvering and horizontal tail surface loads, discussing airworthiness requirements

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Computer programs for calculating airforce coefficients of wing-horizontal tail and fin-horizontal tail oscillating in subsonic flow

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 [AIAA PAPER 69-197] p0200 A71-20307  
 Army rotorcraft performance data, discussing hovering and forward flight performance out of ground and level flight power requirements and drag and compressibility effects  
 [AHS PREPRINT 500] p0448 A71-31076  
 Heavy lift helicopters IFR hover capability with slung load, discussing sensors controls and displays  
 [AHS PREPRINT 540] p0451 A71-31097  
 German VAK 191B combat VTOL aircraft development program, describing prototype ground tests, autopilot preoptimization and hover flight tests  
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 Helicopter, tilt wing and jet lift hovering aircraft outflow measurements to determine suitability as rescue vehicles  
 [AIAA PAPER 71-992] p0700 A71-44586  
 Blade root cutout effects on hover performance of helicopter rotors with rotor thrust and torque characteristics and wake pattern analysis  
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## HUMAN FACTORS ENGINEERING

Role of man in navigation - Conference, Colorado Springs, July 1970

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Man role in future navigation from SAC viewpoint, considering relationships to mission and machine

p0006 A71-10502  
Navigator role in Military Airlift Command /MAC/ as navigator, weather analyst, fuel manager and flight planner

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Electronic control indicator for human pilot capability enhancement using color coded cathode ray display, presenting information from seven different instruments

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Fiber optic faceplates for contrast enhancement under high ambient light conditions for commercial and military cockpits, eliminating ghost, halo and direct sunlight problems

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Aerospace Recommended Practice criteria for flight deck crew escape systems applicable to all commercial aircraft propulsion systems, design speeds and payloads

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Aircraft accidents due to engine-out simulation, discussing human factors, minimum control speed certification requirements and pilot flight training procedures

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## HUMAN PATHOLOGY

Sick and injured transportation aboard regular airliners, considering pathological and psychological contraindications

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Human subjective responses to approaching and receding aircraft sounds during flight over stationary observer

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Community reactions to aircraft noise, discussing short term interim alleviation measures in airport operations and runway usage scheduling

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Pilot subjective evaluation of XB-70 aircraft response to atmospheric turbulence in comparison with measured accelerations

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Air and land transportation noise sources and measurement, noise level scales, and individual and community responses - conference  
[PB-191117] p0037 N71-10349

Community physical, psychological, and social reactions to aircraft noise around 7 US international airports

[NASA-CR-111316] p0050 N71-11032  
Community reactions to aircraft and airport noise from physical, psychological, and social aspects

[NASA-CR-1761] p0532 N71-29023  
Literature survey and bibliography on noise pollution including sources, effects, and control  
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Helicopter pilot and passenger comfort/vibration tolerance criteria

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Air transportation systems ride vibration environments in relation to human comfort

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Survey on acoustics technology emphasizing noise reduction and human tolerances

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Comparison test to evaluate perceived noise level for STOL and other aircraft sounds

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Relations between aircraft and road traffic noise and noise tolerance in communities

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## HUMIDITY

Effect of atmospheric humidity on characteristics of turbofan engine  
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## HUMIDITY MEASUREMENT

Soviet book on fog, cloud and humidity measuring instruments, discussing artificial fog formation and natural fog dispersion problems

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Ice formation and prevention on helicopters, taking into account presence of big drops of undercooled rain

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International conference on rain erosion and associated phenomena

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Supersonic and subsonic combustion modes in constant area ramjet combustors, deriving dimensionless parameter for varying flow ratios as combustion stability criterion

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Supersonic combustion ramjet engine with liquid fuel injection, considering atomization process and ignition criteria

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German monograph on ignition and combustion processes in rapidly flowing gas mixtures covering supersonic flow, ramjet parameters, flow heating, etc

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Hypersonic ramjet reaction mechanisms for H combustion, discussing computational models, operation principles and atomic, radical and molecular collisions

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Development and characteristics of lightweight, mobile structures for aircraft storage and maintenance  
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STRUCTURAL DYNAMICS  
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Flexible pavements design for giant transports considering load repetitions, total systems, environmental effects, etc  
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Rigid and flexible pavement design and construction in Europe, discussing unreinforced and crack reinforced slabs and CBR method  
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Aircraft pavements in UK, discussing reinforced and unreinforced concrete, tar-bound bases and surface coatings  
p0022 A71-12168

Runways, aprons and taxiways strengthening to accommodate higher tire pressures and landing speeds, heavier aircraft and surface riding requirements  
p0022 A71-12169

Aircraft pavements design and construction problems regarding adverse soil conditions  
p0022 A71-12170

Structural efficiency improvement by materials selection for airframe structures, discussing Al, Ti-Al-V and steel panels  
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Wind effect criteria for structural design and engineering of buildings  
p0166 N71-15301

Test facilities on structural engineering at PFA, Sweden  
[PFA-MEMO-61] p0569 N71-29378

**STRUCTURAL FAILURE**

Transmission impending failure detection via lubricating oil monitoring for metal particle content  
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Bent structure failure under pulse floor acceleration shocks, concerning aircraft seat damage during crash landing  
p0204 A71-20747

Materials failure role in Canadian civil aircraft accidents, discussing organized investigation and data flow  
p0211 A71-21679

Structure service life and storage failure probability calculation with current load measurements and laboratory fatigue testing  
p0418 A71-29231

Structural fatigue in aircraft design, discussing twin engine transport tests, crack propagation rate, residual strength, etc  
p0421 A71-29434

Atmospheric turbulence prediction, discussing gust sensitive aircraft design for structural overload and fatigue failure decreases  
[AIAA PAPER 71-775] p0507 A71-34011

Constrained torsion of spar box fastened along isolated parts of wing span, noting structural failure due to tangential stress distribution  
p0542 A71-35313

Electron fractography for high strength steel to determine fatigue life of military aircraft parts  
[NLR-TR-69043-U] p0119 N71-13364

Aircraft design concepts for prevention of structural failure including stress analysis  
[AD-723317] p0619 N71-31683

**STRUCTURAL FATIGUE**

U FATIGUE (MATERIALS)

**STRUCTURAL MATERIALS**

U CONSTRUCTION MATERIALS

**STRUCTURAL MEMBERS**

NT ANISOTROPIC PLATES

NT ANNULAR PLATES

NT BEAMS (SUPPORTS)

NT BOX BEAMS

NT CANTILEVER BEAMS

NT CORRUGATED PLATES

NT FLAT PLATES

NT LONGERONS

NT MEMBRANE STRUCTURES

NT PERFORATED PLATES

NT PLATES (STRUCTURAL MEMBERS)

NT POROUS PLATES

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NT SKIN (STRUCTURAL MEMBER)

## NT STRINGERS

## NT STRUTS

## NT WING PANELS

Carbon fiber reinforced plastics and metals structural components design, discussing properties, processing and applications  
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Aircraft structural elements thermal behavior under aerodynamic heating with linear dependence on initial temperature  
p0364 A71-27493

Wing structural elements ballistic damage tolerance and residual fracture strength characteristics, discussing projectile velocity, impact angle and target thickness effects  
p0540 A71-35161

Sonic boom and explosive shock wave effects on buildings and structural members  
p0050 N71-11035

Computer based methods in man machine interaction for dynamic structural design optimization of stressed-skin structures and structural members  
[AGARD-CP-36-70] p0117 N71-13126

Computer simulation of random response induced by complex, ergodic, Gaussian excitation as function of response spectral densities  
[AD-713141] p0168 N71-15393

Conference on prevention of mechanical failures including bearing failures, spectrographic oil analysis, failure mechanisms of helicopter transmissions, and related problems  
[AD-721359] p0520 N71-28057

Notch sensitivity of flat plates used as structural members in aircraft wings tested on load testing machine  
[TB-89] p0580 N71-30675

Electrical analog for sonic boom indoor pressure wave effect on structural members  
[UTIAS-TN-158] p0648 N71-33964

Reference text on design of aviation structural elements  
[AD-726586] p0682 N71-35220

**STRUCTURAL RELIABILITY**

Complex airframe design for economic and safe operation and long life using fatigue and fracture mechanics  
[AIAA PAPER 70-512] p0221 A71-22025

Combat aircraft vulnerability to projectile impact predicted by model giving target penetration, damage size and structural response  
[AIAA PAPER 71-777] p0507 A71-34013

Diffusion bonding as economical fabrication process for aerospace applications involving Ti alloys, emphasizing mechanical properties and structural reliability improvement  
[SME PAPER AD-71-245] p0560 A71-36661

Method for arranging filamentary, load bearing material to approximate stress condition in gas envelope of free floating balloon for maximizing structural efficiency  
[AD-713188] p0163 N71-14811

Conference on prevention of mechanical failures including bearing failures, spectrographic oil analysis, failure mechanisms of helicopter transmissions, and related problems  
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Analytical procedures for predicting coupled fluid structural responses of aircraft hydraulic systems  
p0688 N71-36276

## STRUCTURAL RIGIDITY

## U STRUCTURAL STABILITY

## STRUCTURAL STABILITY

## NT SHELL STABILITY

LAMS flight control systems for turbulence induced fatigue damage reduction in B-52 and C-5A aircraft, using mathematical models  
p0017 A71-11660

Aircraft light alloys fatigue characteristics for component endurance evaluation  
p0136 A71-16757

Aircraft turbine engines strength and gas dynamic characteristics improved by vibration decrease using elastic elements  
p0212 A71-21710

Beams torsional rigidity under thermal stress due to arbitrary temperature distribution  
p0265 A71-22103

Ti alloys in aircraft industry, considering jet engines applications and structural stability

improvements related to fracture toughness, fatigue and stress corrosion p0274 A71-23292

Plane sandwich plates in supersonic gas flow, investigating aeroelastic stability, transverse shear flexibility and axial loads p0277 A71-23609

Torsional-flexural stability of stiffened Ti panels for application to supersonic transport, using small deflection energy methods [AIAA PAPER 71-338] p0342 A71-25317

Inflation of initially spherical balloon of elastic rubber-like material, discussing tensile instability p0345 A71-25445

Elastic structures stability under randomly fluctuating external loads based on statistical methods p0499 A71-32988

Eccentrically stiffened thin cylindrical panels instability under uniform axial compression, uniform hoop compression and uniform shear p0509 A71-34150

Soviet papers on thin walled aircraft structures strength and stability covering bending theory, circular cylindrical shells, thermal stresses of rectangular plates, etc p0541 A71-35301

Light alloys fatigue characteristics for aircraft components endurance evaluation p0544 A71-35456

Rotor blade stability, calculating unsteady local lift and effects of blade profile camber and steady angle of attack p0544 A71-35468

Application of corrugated core sandwich structures to powerplant components p0054 N71-11636

Hydroelasticity, aeroelasticity, and dynamic stability of bars, plates, shells, and beams of various structural elements. [AD-716938] p0330 N71-20811

Conference on fatigue life in helicopter components [DLR-MTT-70-01] p0455 N71-24385

Rotary wing structural stability of Dornier high temperature gas jet helicopter p0456 N71-24387

Evaluation of helicopter flight loading and structural stability p0456 N71-24389

Structural stability tests of helicopter components p0456 N71-24390

**STRUCTURAL STRAIN**

Strain level counter monitoring aircraft structural fatigue, describing system components consisting of sensors in critical structure areas and indicator unit with visual display p0267 A71-22725

Aircraft fuselage antisymmetric loading strain effects on small aspect delta wing performance p0704 A71-45018

Moire effect analysis of stress and strain of machine parts and structural elements [AD-717826] p0376 N71-22168

**STRUCTURAL VIBRATION**

NT BENDING VIBRATION

NT FLUTTER

NT PANEL FLUTTER

NT SUBSONIC FLUTTER

NT SUPERSONIC FLUTTER

NT TORSIONAL VIBRATION

NT TRANSONIC FLUTTER

Aircraft fuselage vibration response to turbulent boundary layers, measuring structural wavelengths and phase velocities as functions of frequency [ASME PAPER 70-WA/DE-10] p0078 A71-14144

Nonlinear partial differential equation solution for natural free-free vibrations of beam structures [ASME PAPER 70-WA/APM-55] p0078 A71-14172

Analog periodometer with short response time for helicopter blade vibration studies p0135 A71-16736

Fluctuating circulation, lift and flow induced structural vibrations of two dimensional bodies, including vortex shedding on sluice gates p0187 A71-19592

Helicopter vibrational behavior prediction in flight with known aerodynamic loads, using branch modes method

p0277 A71-23606

Al alloys one step fatigue tests under combined high temperature and structural vibration conditions p0294 A71-24821

Automated modal data acquisition and processing system /MODAPS/ for real-time modal vibration testing of complex aerospace vehicle structures, describing features, capabilities and utilization p0435 A71-30341

Parametric and autoparametric instability of aircraft structures p0669 A71-42240

Parametric study of natural frequencies of skin stringer structures [AD-711383] p0043 N71-10734

Wind loading moments produced on scale models of tall buildings in wind tunnel tests p0166 N71-15306

Fuel tank vapor space characteristics for simulated helicopter fuel tank and evaluation of existing potential hazard from vibration environment [AD-875901] p0329 N71-20702

Handbook for summing two harmonics [AD-717201] p0337 N71-21803

Systems analysis of directional control, rotary wing vibratory loads, lift sharing, and fuselage vibration and damping during helicopter maneuvers p0583 N71-30775

**STRUCTURAL WEIGHT**

German monograph on systems analysis of future jet and fan propulsion systems for VTOL commercial aircraft weight and cost reduction p0002 A71-10115

Optimal cross sectional dimensions of thin walled longeron beams and ribs of skin reinforced delta wings minimizing weight p0025 A71-12562

Subsonic aircraft size effect in conventional design, discussing increased weight increments and economic gain rate [AIAA PAPER 70-940] p0026 A71-12676

Aircraft generator service life improvement and weight minimization by close coupling with drive and heat producing components cooling with oil spray and mist p0149 A71-18463

Variable weight composite materials for aircraft optimal adhesive bonding structural designs, discussing C-5A tow weight saving Ti honeycomb applications p0282 A71-24084

Weight minimization of semiinfinite flat sandwich panel at constant dynamic pressure in supersonic flow subject to flutter constraint, using finite element model [AIAA PAPER 71-330] p0342 A71-25310

Optimum vertical surface configuration for STOL transports, considering structural weight and performance requirements [AIAA PAPER 71-769] p0506 A71-34006

Aircraft structural parameters optimization satisfying flutter velocity constraint and minimum mass, applying to box beam design p0537 A71-34874

High modulus graphite composites application for structural weight reduction and stiffness requirement without strength loss p0540 A71-35202

High voltage DC electric power transmission systems with ground return, reducing aircraft wiring weight and energy dissipation p0549 A71-35771

Integrated drive generator for aircraft electrical power systems, improving weight, life and reliability p0549 A71-35781

Administrative techniques of cost/weight tradeoff program for jet transport airplane [SAWE PAPER 899] p0550 A71-35812

Statistical analysis of error sources and magnitudes in Boeing 747 weight values obtained by onboard aircraft weighing system and by manual calculations [SAWE PAPER 897] p0551 A71-35813

Composite materials effect on supersonic aircraft weight, design and performance [SAWE PAPER 888] p0551 A71-35818

Weight reduction potential of composite materials in aerospace structures, proposing weight estimation

- technique  
[SAE PAPER 887] p0551 A71-35819
- Design, analysis and testing of F-111 complex  
fuselage full scale section of composite  
materials, noting weight savings  
[SAE PAPER 889] p0552 A71-35825
- Composite structures development, discussing wing,  
fuselage, aeropropulsion and missile development,  
weight savings of hardware and fighter empennage  
applications  
[AIAA PAPER 71-367] p0555 A71-36275
- Aircraft electronic or fly by wire control systems,  
discussing aircraft design fuel-structure weight  
reduction cycle and control system redundancy  
requirements  
[AIAA PAPER 71-959] p0598 A71-37200
- Real weight formula for shell fuselages based on  
theoretical similarity considerations  
p0615 A71-39411
- Civil transport aircraft and equipment maintenance  
and reliability problems solutions with best time,  
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p0702 A71-44765
- Ideal weight of axisymmetric fuselage shells, taking  
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p0704 A71-45180
- Components for low weight/small volume aircraft gas  
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- Analytical nonlinear landing gear model of flexible  
aircraft and strut lockup-breakout interaction  
using digital simulation language /DSL/  
[SAE PAPER 710401] p0287 A71-24263
- Thermal performance of hypersonic engine struts  
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- SUBASSEMBLIES**
- Experimental flight mechanics in terms of data  
processing quality, discussing subsystems control  
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- U CIRCUITS**
- U SUBASSEMBLIES**
- SUBCRITICAL FLOW**
- Subcritical nonlinear potential flows over two  
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of integral relations  
p0556 A71-36330
- Subcritical flows over two dimensional airfoils by  
multistrip method of integral relations  
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- Pressure distributions calculated with Sells method  
on series of quasi-elliptical symmetrical airfoils  
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- Approximation of pressure distribution on wing-body  
configurations at subcritical speeds  
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- SUBLATTICES**
- U LATTICES (MATHEMATICS)**
- SUBMILLIMETER WAVES**
- Starlifter borne large aperture astronomical  
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discussing design and operation  
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- Subsonic aircraft size effect in conventional  
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- Subsonic jet engine noise reduction, considering  
turbojets, turbofans and jet suppressors  
p0214 A71-21814
- Cruising flight range as function of  
supersonic/subsonic transport fuselage geometrical  
parameters  
p0364 A71-27494
- Military aviation greases for subsonic commercial  
airplane lubricants, discussing economic and  
technical benefits based on service experience and  
testing  
[SAE PAPER 710411] p0404 A71-28304
- Economic analysis of subsonic transport airplane  
design, evaluation and operation  
[SAE PAPER 710423] p0405 A71-28310
- Fuselage influence on total aircraft drag in  
subsonic passenger aircraft, considering high  
aspect ratio cylindrical fuselages  
p0444 A71-30821
- Soviet book on subsonic gas turbine passenger planes  
power supply systems covering Boeing 747, short  
haul aircraft, DC-10, L-1011, etc  
p0534 A71-34472
- Wing group weight prediction for subsonic aircraft  
design, taking into account root bending moments  
due to lift  
p0552 A71-35925
- Wind tunnel evaluation of interference drag in  
turbofan engine-wing configuration of subsonic  
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p0304 N71-19376
- Computerized prediction of flow field interference  
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- Three dimensional wings harmonic oscillation with  
arbitrary frequency in subsonic flow, presenting  
approximation method for singular integral  
equation  
p0009 A71-10844
- Lifting surface in unsteady subsonic flow,  
describing integral equation calculation method  
including kernel logarithmic singularity  
p0012 A71-11020
- Small perturbation subsonic flows aerodynamic noise,  
using matched asymptotic expansions method  
p0023 A71-12377
- Spanwise distribution of induced drag in subsonic  
flow by vortex lattice method, noting  
applicability to rotary derivatives in stability  
analysis  
p0028 A71-12691
- Sound generation by rotor-stator interaction in  
subsonic axial flow compressors, using  
acceleration potential and wake technique  
p0067 A71-13277
- Wings with control surfaces in unsteady subsonic  
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[ONERA-TP-889] p0090 A71-15355
- Supersonic jet-bounded subsonic wake interactions,  
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p0136 A71-16848
- Subsonic fan noise, using helicopter rotor noise  
theory for analysis of phase related and randomly  
time varying flow distortions  
p0140 A71-17161
- Pressure distribution singularity at tip of thin  
lifting parabolic wing in subsonic flow  
[AIAA PAPER 71-10] p0150 A71-18484
- Noise-producing subsonic jet turbulence eddies  
hot-wire anemometer measurements of convection  
velocity as functions of frequency  
[AIAA PAPER 71-154] p0154 A71-18596
- High subsonic jet near-field acoustic energy flux  
distribution calculation from pressure gradient  
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[AIAA PAPER 71-155] p0154 A71-18597
- Approximation of Chaplygin equation for subsonic  
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p0197 A71-20083
- Multilink approximation of Chaplygin function in  
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coupling conditions relative to modified stream  
function at approximation nodes  
p0198 A71-20090
- Prandtl-Glauert pressure distribution rule  
improvement subsonic planar flow  
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- Elastic swept wing subsonic aerodynamic  
characteristics, taking into account aerodynamic  
load redistribution due to aeroelastic  
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p0222 A71-22035
- Pressure distribution on arbitrary finite  
symmetrical wings with rounded leading edges at  
zero incidence in subsonic flow  
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- Supersonic and subsonic jets coexistence in  
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flow boundaries by pressure readings and Schlieren  
flow visualization  
p0277 A71-23605
- Aerodynamic forces on harmonically oscillating wing  
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- Unsteady inward and outward velocities of subsonic radial air flow between two disks, using hot-wire anemometer and cylindrical wave equation  
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- Turbulent wakes from subsonic-hypersonic bodies for downstream mean flow predictions analysis, considering eddy viscosity function  
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- Air and carbon dioxide intensive injection effect on turbulent boundary layer of subsonic channel air flow  
p0290 A71-24378
- Subsonic turbulent boundary layer noise generation and acoustic pressure on aircraft surface, using Lighthill theory  
p0298 A71-24952
- Compressibility correction for subsonic flows past bluff bodies, considering boundary distortion and pressure distribution shift  
p0339 A71-25149
- Loads induced on infinite aspect ratio wing by straight infinite free vortex in subsonic compressible freestream, using planar lifting surface theory  
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- Steady three dimensional subsonic nonviscous flow through turbomachine with arbitrary hub and shroud shapes and finite blade number, using iterative blade to blade procedure  
[ASME PAPER 71-GT-2]  
p0348 A71-25948
- High subsonic flow two dimensional turbine cascade design by approximate hodograph method, noting pressure distribution measurements  
[ASME PAPER 71-GT-34]  
p0350 A71-25971
- Heat transfer within resonant cavities at subsonic and supersonic flow, discussing wind tunnels, test procedures and data reduction  
[ASME PAPER 71-FE-9]  
p0421 A71-29450
- Pisa University Aeronautical Institute activities /1960-1970/, considering supersonic and subsonic flow research, thin stiffened shells fatigue under compressive or tensile loads, etc  
p0444 A71-30822
- Two dimensional subsonic irrotational isentropic flow around thick profiles, using coordinate perturbation method  
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- Oscillating thin wing with control surfaces in two dimensional compressible subsonic flow, calculating aerodynamic forces based on kernel function method  
p0499 A71-33013
- Cascading turbomachine blades vibrations measurement in subsonic and sonic high temperature gas flows, describing test facility  
p0505 A71-33993
- Subsonic turbulent jets acoustic emission, calculating noise intensity in far field for various Mach numbers  
p0533 A71-34213
- Stream lines construction in meridional plane of blade nozzle annular cascades of steam and gas turbines in subsonic and supersonic flow  
p0534 A71-34446
- Subcritical nonlinear potential flows over two dimensional subsonic airfoils by multistrip method of integral relations  
p0556 A71-36330
- Critique of paper on spanwise distribution of induced drag in subsonic flow by vortex lattice method, noting infinities in downwash across all vortex lines  
p0599 A71-37297
- Three dimensional nonlinear subsonic flow over finite wings of arbitrary planform, solving transonic small disturbance equation by integral method  
p0616 A71-39568
- Two dimensional jet flapped symmetric wing in subsonic flow, assuming irrotational flow inside jet bounded by vortex sheets  
p0651 A71-40172
- Spanwise lift distribution over wings and wake formation in thin airfoils of finite aspect ratio in linear subsonic potential flow  
p0654 A71-40495
- Pitot tube interaction with subsonic rarefied gas flow, considering impact pressure  
p0658 A71-40695
- Resultant aerodynamic forces on circular arc profile with normal jet in subsonic steady compressible flow, using Imai-Lamla approximation method  
p0698 A71-44271
- Streamline curvature analysis of compressible subsonic, transonic and supersonic cascade flows in axial turbine blades  
p0698 A71-44347
- Acoustic noise output from round interfering subsonic jets, considering suppressor nozzle attenuation  
p0699 A71-44560
- Subsonic force effect calculations on rectangular wings, using downwash velocity potential method  
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- Linear theoretical method for arbitrary wing planform and trailing edge control surfaces in low frequency oscillatory motion in subsonic flow  
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p0047 N71-11013
- Computation of pressure induced by control surface oscillation in subsonic flow  
[NASA-TT-F-13385]  
p0105 N71-12219
- Transient pressures and aerodynamic coefficients of rectangular wings in subsonic flow using linear equations  
[ONERA-NT-163]  
p0119 N71-13402
- Yawing moments of swept wings in asymmetric subsonic potential flow  
[NPL-AERO-NOTE-1084]  
p0170 N71-15703
- Jet exhaust nacelle subsonic flow simulation  
[ARC-CP-1111]  
p0228 N71-17113
- Lift and aerodynamic drag due to trailing-edge flaps on sweptback wings in inviscid subsonic flow  
[ARC-CP-1110]  
p0229 N71-17114
- Numerical analysis of low frequency subsonic lifting surface theory noting wing oscillations in steady flow  
[ARC-R/M-3634]  
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- Mathematical models for control surface wings in subsonic unsteady flow  
[ONERA-TP-889]  
p0251 N71-18473
- Numerical solution of mixed supersonic and subsonic steady wake flows by time-dependent method  
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- Tabulated data for wing planforms with variation in sweepback, tapering and aspect ratio noting correction to subsonic lifting device theory  
[ARC-CP-1137]  
p0518 N71-27715
- System of nonlinear equations of motion for isentropic, compressible fluid solved by cyclic relaxation method for subsonic and transonic regimes  
p0530 N71-28688
- Numerical analysis of aerodynamic loads on wing and tail surfaces with oscillations in unsteady supersonic and subsonic flow including interference lift  
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p0566 N71-29333
- Aerodynamic load predicting for control surfaces in unsteady supersonic and subsonic flow  
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- Numerical analysis of aerodynamic loads and coefficients for tandem and T tail surfaces harmonically oscillating in subsonic flow  
p0566 N71-29335
- Computer programs for evaluating subsonic flow over wing-tail, wings with folded tips, T tails, and cruciform tail surfaces  
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- Computer programs for calculating airforce coefficients of wing-horizontal tail and fin-horizontal tail oscillating in subsonic flow  
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- Application of lifting surface theory to wing with control surfaces in unsteady subsonic flow  
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- Aerodynamic characteristics of elastic swept wing of aircraft in subsonic flow with given weight, overload, and dynamic head  
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- Computer program for aerodynamic characteristics evaluation of multiple-component airfoils in subsonic, viscous flow  
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- Spanwise integration of kernel functions for calculating wing lift distributions in subsonic flow  
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- Computer program for calculating lifting force distributions on symmetrical and cambered wings in subsonic flow based on numerical integration and lifting surface theory p0643 N71-33220
- Subsonic near wake of blunt-based axisymmetric body in uniform steady flow wind tunnel p0647 N71-33811
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- Steady tailplane lift effect on subcritical response of subsonic T tail flutter aircraft model in low speed wind tunnels [ARC-R/M-3652] p0515 N71-27096
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- Aerodynamic forces on control surfaces in subsonic range, investigating pressure distribution on harmonically oscillating wing p0081 A71-14347
- Trajectories prediction for subsonic spin stabilized projectiles via water tunnel tests, considering blunt nose and tail and rounded nose right circular cylinders [AIAA PAPER 71-296] p0220 A71-22016
- Subsonic and supersonic airline operations, restraints, considering noise, air pollution and inadequate airport facilities p0358 A71-26870
- Transonic wind tunnel testing of air intake and afterbody of double flux engine nacelle at high subsonic Mach numbers and high Reynolds numbers [ONERA-TP-943] p0554 A71-36021
- Nonreversible hydraulic control design and emergency maintenance for Tu 154 aircraft subsonic cruising at 11 km altitude p0691 A71-42927
- Reynolds number effect on wind velocity distribution at subsonic speed [AD-712527] p0103 N71-12206
- Experimental aerodynamic performance characteristics of rotor entry vehicle configuration - subsonic [NASA-TN-D-7046] p0177 N71-16533
- Subsonic aerodynamic characteristics of model of HL-10 flight research vehicle with basic and modified tip fins [NASA-TN-X-2119] p0177 N71-16538
- Vortex-lattice PORTTRAN program for estimating subsonic aerodynamic characteristics of complex planforms [NASA-TN-D-6142] p0236 N71-17424
- Possibilities for scale effect on swept wings at high subsonic speeds on basis of pressure plotting tests [ARA-18] p0323 N71-20157
- Resonant cavity heat transfer in turbulent, subsonic and supersonic speeds including resonance effects p0327 N71-20540
- Multhopps subsonic lifting surface theory, using least squares method [NAL-TN-24] p0382 N71-22472
- Wind tunnel investigation of hypersonic transport model aerodynamic characteristics at Mach numbers to 6 - graphs [NASA-TN-D-6191] p0389 N71-23127
- Construction of leading edges of surfaces for aerial vehicles performing from subsonic to above transonic speeds [NASA-CASE-XLA-01486] p0397 N71-23497
- Experimental investigation of large scale, two dimensional, mixed compression inlet system [NASA-TN-D-6392] p0513 N71-26985
- Correction for straight trailing edges for subsonic slender wing theory using asymptotic expansions p0674 N71-34012
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- Pulsed subsonic wind tunnel, calculating instantaneous flow velocity with allowance for boundary layer thickness at walls p0280 A71-23855
- Skin friction drag and velocity profile measurements on flat plate in two phase circular pipe flow in subsonic wind tunnel for gas-solid media, using photographic technique [ASHE PAPER 71-PB-32] p0421 A71-29467
- Fan-produced sound pressure fluctuation in very low speed subsonic wind tunnel test stream, noting resulting anemometer calibration errors p0437 A71-30526
- Sting-free aerodynamic drag measurement on ellipsoidal cylinders in subsonic wind tunnel at transition Reynolds numbers p0554 A71-36037
- Heated jet interaction with deflecting flow in subsonic wind tunnel, presenting flow visualization and temperature and velocity profiles [ASHE PAPER 71-HT-2] p0604 A71-37980
- Turbulence measurement in subsonic wind tunnel gas jet flows containing dust particles, using Doppler difference laser velocimeter p0652 A71-40397
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- Wind tunnel study of aerodynamic interference drag caused by fan jet engine wake of subsonic transport [NASA-TN-D-6067] p0045 N71-11004
- Subsonic wind tunnel investigation of rotary wing configurations for VTOL aircraft in cruise mode [NASA-TN-D-5945] p0049 N71-11025
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### TRANSISTORS

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p0652 A71-40399
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- Ground boundary layer effects of fixed ground plane for powered STOL wind tunnel model, discussing flow breakdown criteria, contraction lag, strut fairing interference, etc  
[AIAA PAPER 71-266]  
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- Single and multiple sting support evaluation for unmodified interference free wind tunnel data over 0.85 to 2.2 M range using image method  
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- Wind tunnel testing of base pressure model attached to long cylindrical body extended and supported far upstream  
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- Rocket/launcher aerodynamic interference effects investigation by wind tunnel simulation, determining interference coefficients for rockets ballistic dispersion calculations  
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- Three degree of freedom gas bearing for wind tunnel dynamic measurements, allowing models simultaneous spin, pitch and yaw motions  
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- Ballistic wind tunnel for drag measurement on models during free flight at supersonic speeds  
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- Augmentor wing high-lift aerodynamics, discussing results of wind tunnel tests and simulation studies  
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- Aerodynamic support interference in wind tunnel testing of configurations involving bulbous base, mass addition, transition near base and hypersonic low density flows  
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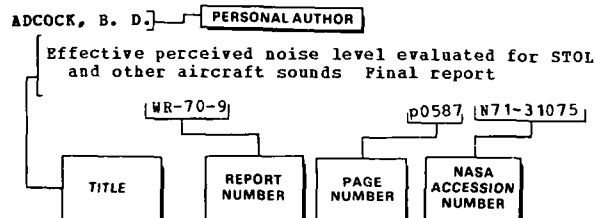
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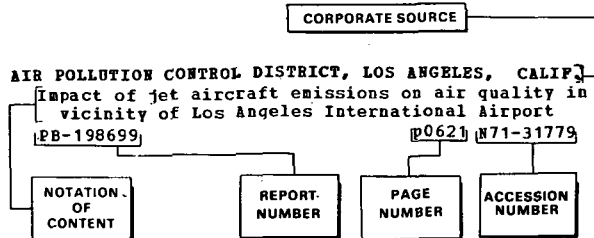
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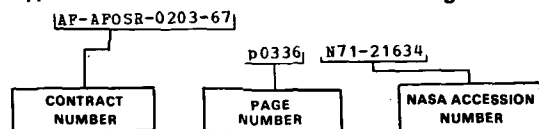
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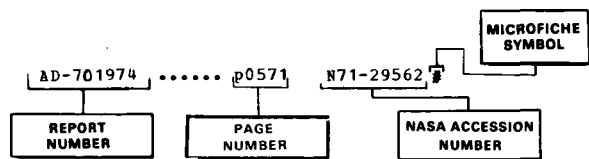


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